

# Surgical Approach to Nipple Discharge: A Ten-Year Experience

MARIA GIOFFRÈ FLORIO, MD,<sup>1\*</sup> TERESA MANGANARO, MD,<sup>1</sup> ANDREA POLLICINO, MD,<sup>2</sup>  
PAOLA SCARFO, MD,<sup>2</sup> AND BIAGIO MICALI, MD, FACS<sup>1</sup>

<sup>1</sup>Division of General Surgery, Faculty of Medicine, University of Messina, Italy

<sup>2</sup>Oncology Unit, Faculty of Medicine, University of Messina, Italy

**Background and Objectives:** The actual relationship between malignancy and secreting breast has not yet been extensively verified, mainly in patients with nipple discharge but without evidence of a breast lump. This study was carried out in 1,251 consecutive patients to evaluate the reliability of cytology combined with galactography in order to assess the relationship of malignant and premalignant lesions with discharge without the presence of a breast lump.

**Methods:** Those patients with bilateral discharge were approached endocrinologically, whereas the patients (433) with unilateral secretion were evaluated by cytology, mammography, fine needle biopsy, and galactography. Of 194 patients without a breast lump, 94 with positive cytology were surgically treated after mammogalactography. Surgical treatment included ductgalactophorectomy in 53, segmentectomy in 23, microdochectomy in 13, and mastectomy in 5 patients.

**Results:** Pathologic findings showed a solitary papilloma in 49 cases, minimal breast cancer in 20, fibrocystic disease in 11, papillomatosis in 7, lobular cancer in 5, and, finally, a duct ectasia in 2.

**Conclusions:** In the patients with secreting breast but without lump, cytological analysis in addition to galactography seems to be useful in identifying minimal breast cancer and in detecting premalignant lesions like papillomatosis. *J. Surg. Oncol.* 1999;71:235–238 © 1999 Wiley-Liss, Inc.

**KEY WORDS:** minimal breast cancer; breast neoplasms; galactography; papillomatosis

## INTRODUCTION

Secreting breast is a complex pathologic finding which can account for up to 7% of all breast symptoms and can be due to both benign and malignant diseases [1]. To be significant a discharge should be true, spontaneous, persistent, and, of course, nonlactational. Moreover, unilateral and single-duct nipple discharge is more important than bilateral and multiple-duct discharge. The former is usually caused by a localized lesion (benign or malignant), while the latter is expression of a generalized involutionary change in the breast or an endocrine abnormality. Although, conventionally, the management of single-duct discharge is surgical, surgery could also have a role in the treatment of multiple-duct discharge [1–4].

The aim of the study is twofold: first, to assess the frequency of malignant and premalignant conditions in

those patients complaining of unilateral breast discharge without a mass as a presenting symptom; and second, to evaluate the reliability of cytological examination of nipple discharge combined with galactography in the assessment of breast pathology.

## MATERIALS AND METHODS

Between January 1987 and December 1996, 1,251 female patients (age range: 16–83 years) with spontaneous nipple discharge were referred to our institution. The

\*Correspondence to: Professor Maria Giofrè Florio, Chirurgia Generale V, Pad.C, piano 4, Policlinico Universitario, 98100 Gazzi (Messina), Italy. E-mail: Micalib@imeuniv.unime.it

Accepted 9 April 1999

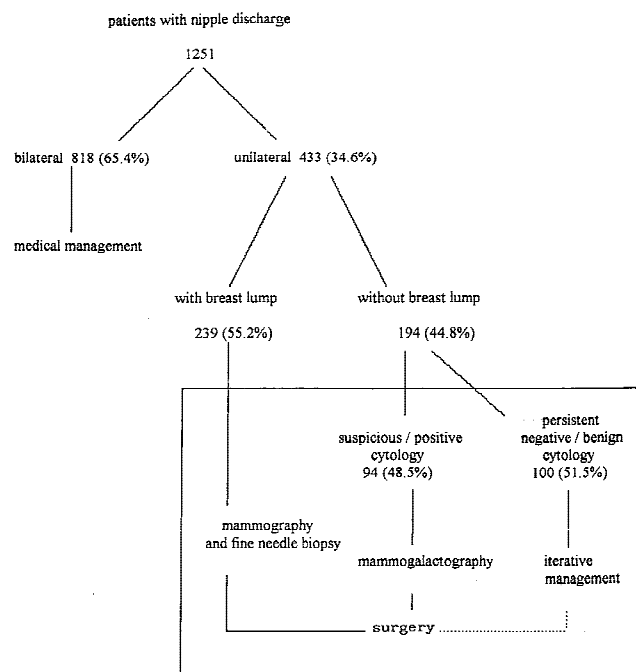


Fig. 1. Algorithm of studies of patients with nipple discharge and their management.

algorithm of studies performed and management is shown in Figure 1.

In 818 patients (65.4%), the discharge was bilateral; in 433 (34.6%), it was unilateral. Those patients (818) with bilateral breast secretion were submitted to clinical and biochemical investigation and treated appropriately. Patients with unilateral nipple discharge (433) were managed as follows.

Those with associated breast lump (239) were submitted to mammography followed by fine needle biopsy (FNB). Of the 239 patients, 150 were diagnosed as having fibrocystic disease, 35 ductal infiltrating cancer, 15 duct ectasia, 11 lobular cancer in situ, 11 nonpuerperal breast aberrant, 10 lactating adenomas, and 7 fat necrosis. Surgical approach was adopted according to the different pathologic findings.

Patients with unilateral nipple discharge but without breast lump (194) were submitted to three cytologic examinations of discharge (at 0, 1, and 2 months) and to mammogalactography for further evaluation of the nature and site of the lesion causing discharge.

After mammogalactography, those with suspicious or positive cytology (94 patients) underwent surgery according to the pathology defined by extemporary histologic examination. The patients (100) with persistent negative cytology received an iterative management (follow-up, further cytological examinations, mammogalactography), with surgery advised for those who later became positive.

TABLE I. Results of Cytologic and Galactographic Examination in Patients (94) With Unilateral Discharge and Without Lump

Breast pathology	Cytology (+)	Galactography (+)	Concordance (%)
Solitary papilloma	47/49	45/49	81.6*
Minimal breast cancer	18/20	15/20	75.0**
Fibrocystic disease	5/11	8/11	63.6
Papillomatosis	5/7	5/7	85.7*
Lobular cancer	4/5	2/5	60.0
Duct ectasia	1/2	2/2	50.0
Total	80/94 (85.1%)	77/94 (81.9%)	69.91

\* $P < 0.01$  (sign-rank test); \*\* $P < 0.05$ .

Cytological evaluation of nipple discharge was ranked according to Ciatto [2] as follows:

- 1. negative/benign: evidence of normal cells or benign lesions other than papillomas;
- 2. benign/papilloma: evidence of papilloma cells;
- 3. suspicious/positive: evidence of cells with mild to strong atypias.

The galactographic report was evaluated as follows according to our previous reports [5,6]:

- 1. negative: no abnormality or evidence of benign lesions other than papilloma;
- 2. benign/papilloma;
- 3. suspicious.

Statistical analysis was performed by means of the sign-rank test.  $P$  values of less than 0.05 were considered to be significant.

## RESULTS

The results of cytologic examination of nipple discharge and of galactography in the 94 patients without breast lump are shown in Table I.

Of the 94 patients with suspicious/positive cytology, 49 patients (52.1%) were diagnosed with solitary papilloma, 20 patients (21.3%) had minimal breast cancer (16 T1a, 4 T1b), 11 (11.7%) had fibrocystic disease, 7 (7.4%) had papillomatosis, 5 (5.3%) had lobular multifocal cancer (D+), and 2 (2.1%) had duct ectasia.

The concordance between the two diagnostic examinations is high ( $P < 0.01$ ) in papillomatosis (85.7%) and in solitary papilloma (81.6%), medium ( $P < 0.05$ ) in minimal breast cancer (75%), and low in fibrocystic disease (63.6%).

Surgical management was advised according to the cytologic, galactographic, and extemporary histologic diagnosis (Table II). Briefly, segmentectomy focused on the secreting duct, or ductogalactophorectomy, were performed in cases with solitary papilloma and with papillomatosis. Segmentectomy + lymphadenectomy (LA) was executed in the treatment of minimal breast cancer.

**TABLE II. Breast Pathology and Surgical Treatment in the 94 Patients With Positive Cytology and Without Breast Lump**

Breast pathology	%	(No.)	Surgical operation
Solitary papilloma	52.1	49	Ductogalactophorectomy
Minimal breast cancer	21.3	20	Segmentectomy + Lymphadenectomy (LA)
Fibrocystic disease	11.7	11	Ductogalactophorectomy or excision
Papillomatosis	7.4	7	Segmentectomy or ductogalactophorectomy
Lobular cancer	5.3	5	Modified radical mastectomy + LA
Duct ectasia	2.1	2	Microdochectomy
Total	100	94	

Modified radical mastectomy + LA was performed in lobular multifocal cancer.

## DISCUSSION

Nipple discharge represents an alerting symptom which requires careful investigation, since it could relate to benign as well as to malignant breast lesions [3,7,8].

There are several conditions leading to false or pseudo nipple discharges, like eczematous lesions, infections, and nonspontaneous discharges secondary to drug intake. Generally such discharges are bilateral and from multiple ducts, and can be treated medically.

A unilateral and single-duct nipple discharge is more relevant, usually as evidence of a localized lesion. In our study the latter type of discharge was observed in 433 patients, requiring more specific investigation. The evidence of a breast mass which correlates with a clinically significant discharge implies the necessity of a correct management. When we found an associated lump, the conventional diagnostic approach consisting of mammography and fine needle biopsy was generally followed.

Excision of the breast lump and histologic examination of the removed tissue was usually accomplished in these 239 (55.2%) patients. When required from a malignant lesion, the excision was completed and associated with axillary lymphadenectomy.

In the remaining patients, particularly in those with significant discharge but without a related lump, an operative approach is mandatory because of the possible relationship with cancer or precancerous conditions. In these cases, the major concern is a careful diagnosis to exclude a carcinoma. Although some authors have correlated the type of discharge with the nature of the breast lesion—differentiating between yellow, serosanguinous, bloody, and clear secretion [3,9]—several studies, including the present one, did not find such correlation [7,10–12].

Cytological examination of the discharge should be an essential step of the evaluation [9], and recently a very

high sensitivity of cytological examination was reported [13]. Ciatto et al. [2] found a 40% concordance of cytology with malignant pathology. A relatively high false-negative rate of 18% in cancer patients was further reported by Leis [3]. In the present study, cytology showed a false-negative rate of 16%, thus suggesting it to be useful but not an accurate procedure by itself.

Soft-tissue mammography should be considered an important adjunct to the diagnosis and treatment of breast malignancies, but its sensitivity in cases of nipple discharge derived from intraductal lesions is not high. The value of the mammogram can be improved, thanks to contemporary presence of microcalcifications, which are, however, seldom associated with nipple discharges and are sometimes undetectable by mammography [7,14].

Breast papillomas (including solitary papilloma, multiple papillomas, and papillary carcinoma) which are the common cause of discharges are also not seen on mammograms because of their small size and the intraductal site [15]. This finding is consistent with the results of Woods et al. [16], who found normal mammographic findings in almost 60% of patients with breast papillomas.

A number of authors [3,12,17,18] have postulated that galactography can be the diagnostic procedure of choice in patients with nipple discharge.

Tabar et al. [18] imply that galactography is the best method for preoperative evaluation of the nature and site of the lesion causing nipple discharge. They reported a sensitivity rate of 100% in patients with cancer, although half of them had a detectable mass on mammograms. On the other hand, a mild accuracy rate of 39% for detection of breast cancer showing nipple discharge was reported by Ciatto et al. [2].

Our results showed a galactographic accuracy of almost 70% in detecting or strongly suspecting a breast malignancy causing nipple discharge. The frequent evidence of significant overlap in galactographic findings did not allow a reliable discrimination between carcinoma and benign papilloma. At any rate, the sensitivity of the procedure seems to be improved when added to cytology, together with which it reaches a satisfactory concordance in patients with minimal breast cancer, and particularly in those with benign papilloma that implies a higher risk of subsequent carcinoma [19]. A serious problem is presented in the instances where there is significant discharge without evidence of a breast lump. A careful evaluation of these 194 patients showed in 48.5% a lesion which could be surgically treated. If one considers that the occurrence of carcinomas and papillomas was detected in 81 of 94 patients (86.2%), some conclusions can be drawn regarding the ability of cytologic and galactographic procedures to correctly diagnose the cases of malignant and premalignant lesions showing nipple secretion only.

In particular, galactography provided important information on the location of the lesion causing discharges. Finding these locations is the major challenge in guiding the surgical excision, mainly in patients in whom the nipple discharge is the only symptom.

In conclusion, our data support that only the combined use of cytology and galactography yielded a correct diagnosis in almost all cases of secreting breast. The procedure allows a proper, minimally invasive surgery which can easily be performed in cases of breast carcinoma or papilloma.

## REFERENCES

1. Leis HP, Greene FL, Cammarata A, et al.: Nipple discharge: Surgical significance. *South Med J* 1988;81:22–25.
2. Ciatto S, Bravetti P, Berni D, et al.: The role of galactography in the detection of breast cancer. *Tumori* 1988;74:177–181.
3. Leis HP: Management of nipple discharge. *World J Surg* 1989; 13:736–742.
4. Leis HP: The diagnosis and treatment of nipple discharge. In Ariel IM, Cahan AC (eds): "Treatment of Pre-Cancerous Lesions and Early Breast Cancer." Baltimore: Williams and Wilkins, 1993:21–31.
5. Pandolfo I, Racchiusa S, Gioffrè M, et al.: Lo studio contrastografico della patologia duttale della mammella. *Rad Med* 1981;67(10):725–732.
6. Gioffrè Florio MA, Caruso A, Manganaro T, et al.: Diagnosis and treatment of secreting breast. Analysis of 45 cases. In Montorsi M, Granelli P (eds): "XXVI World Congress of the International College of Surgeons." Bologna: Monduzzi Editore, 1988:451–453.
7. Fung A, Rayter Z, Fisher C, et al.: Preoperative cytology and mammography in patients with single-duct nipple discharge treated by surgery. *Br J Surg* 1990;77:1211–1212.
8. Abe R: The operative management of intraductal papilloma of the breast. *Jpn J Surg* 1990;20:240–245.
9. Rimsten A, Skoog V, Stenkvist B: The significance of nipple discharge in the diagnosis of breast disease. *Acta Clin Scand* 1976;142:513–518.
10. Haagensen CD: Nipple discharge. In Haagensen CD, Bodian C, Haagensen DE (eds): "Breast Carcinoma: Risk and Detection." Philadelphia: W.B. Saunders Co., 1981:146–237.
11. Seltzer MH, Perloff LT, Kelly RI, et al.: The significance of age in patients with nipple discharge. *Surg Gynecol Obst* 1970;131: 519–522.
12. Paterok EM, Rosenthal H, Sabel M: Nipple discharge and abnormal galactogram. Results of a long-term study (1964–1990). *Eur J Obst Gynecol Rep Biol* 1993;50(3):227–234.
13. Ranieri E, Virno F, D'Andrea MR, et al.: The role of cytology in differentiation of breast lesions. *Anticancer Res* 1995;15(2):607–611.
14. Urban JA, Egeli RA: Non-lactational nipple discharge. *Cancer* 1978;28:130–140.
15. Paulus DD: Benign diseases of the breast. *Radiol Clin North Am* 1983;21:27–50.
16. Woods ER, Helvie MA, Ikeda DM, et al.: Solitary breast papilloma: Comparison of mammographic, galactographic and pathologic findings. *Am J Radiol* 1992;159:487–491.
17. Katz R, Lerner M, Feller N: Galactography in nipple discharge: A statistical analysis and comparison with mammography. *Breast* 1982;21:8–18.
18. Tabar L, Dean PB, Pentek Z: Galactography: The diagnostic procedure of choice for nipple discharge. *Radiology* 1983;149:31–38.
19. Ciatto S, Andreoli C, Cirillo A, et al.: The risk of breast cancer subsequent to histologic diagnosis of benign intraductal papilloma follow-up study of 339 cases. *Tumori* 1991;77:41–43.